flection, but only the radiated heat; and the rate with which the bulb, if spherical, would radiate heat, would be to that with which it would receive and absorb heat as μ^{θ} to $\frac{1}{2}\, r'\, \mu^{\theta'}$, in which r' is the relative radiating power of the earth's surface. Hence for the static temperature of the thermometer, that of the earth's surface being supposed to be stationary, we should have

$$\mu^{\theta} = \tfrac{1}{2}\, r'\, \mu^{\theta'}, \text{ or } \theta - \theta' = 300 \log \tfrac{1}{2}\, r'.$$

In case of a maximum radiating power of the earth's surface, in which case $r' = 1$, we have

$$\theta' - \theta = -\ 300 \log \tfrac{1}{2} = 300 \times 0.301 = 90^{\circ}\ \text{C.}$$

for the difference between the temperature of the earth's surface and that of the exposed thermometer, the latter being the less. It is seen that the difference is the same, whatever the temperature of the earth's surface. According to this result, if the temperature of the earth's surface were maintained at 0° C., that of the thermometer would be −90° C., if the law of Dulong and Petit can be extended to so low a temperature.

If the earth's surface were polished silver, and of the ordinary temperature, the temperature of the thermometer would be nearly that of absolute zero. If we suppose that the earth's atmosphere, when clear, radiates and reflects back to the body four-fifths as much heat as the body radiates into it, then the enclosure, comprising the earth's surface on the one side, and the atmosphere on the other, lacks one-tenth of completeness, and we then have from the preceding expression,

$$\theta' - \theta = -\ 300 \log 0.9 = 300 \times 0.046 = 13.8^{\circ}\ \text{C.}$$

for the difference between the temperature of the earth's surface and that of the thermometer, in case the thermometer received no heat by convection and conduction from the surrounding warmer air. In the case of Melloni's cups, the former of these is prevented, and hence the thermometer in these stands at a lower temperature than one does suspended in the open air, where the colder air immediately in contact with the thermometer-bulb falls down, and warmer air takes its place.

Supposing the atmosphere and the earth's surface to furnish nine-tenths of a complete enclosure to a body near the surface, then, at an altitude which leaves one-half of the atmosphere below it, they would furnish something more than 0.7 of a complete enclosure; for the amount of heat escaping into space is not quite proportional to the mass passed through, especially in the case of dark heat. We should have, in this case,

$$\theta' - \theta < -\ 300 \log 0.7, \text{ or } 46.5^{\circ}\ \text{C.},$$

in case of no convection and conduction; but these, of course, would diminish the difference very much. This result, in comparison with the preceding one, explains the low temperatures of bodies at night, when exposed in the air on high mountains a little above the earth's surface, so as to receive no heat from contact with the surface.

The greater the altitude, the more nearly would the difference approximate to 90° C., and would sensibly reach it at a point leaving no sensible portion of atmosphere above it, and even surpass it if the point were so high as to sensibly diminish the subtending solid angle.

The whole of the earth's surface, of course, cools considerably during a clear night; but this only continues until a temperature gradient is formed by which heat is conducted from the lower strata to the surface as fast as it is radiated into the atmosphere. This state, however, can be only approximately reached, and, if the night were continued, the cooling would still go on; but the rate of cooling becomes very small in the latter part of an ordinary night, and much less in that of a polar night. Bodies exposed in the open air, of course, receive no sensible amount of heat by conduction of heat through the air up to the bodies, and so their temperatures fall much lower than that of the earth's surface, and the differences are given by the preceding conditions.

WM. FERREL.

Maori poetry.

An example of Maori poetry may be interesting to some of your readers. The first is a modern Maori love-song composed by a young native and sent to his sweetheart. I am indebted to Mr. C. O. Davis of Auckland, New Zealand, for the translations.

At eventide I lay me down to rest,
As winds from the great ocean pierce my frame.
Come, ye soft northern airs, hasten your speed,
With messengers of love to me. O maiden!
Send me thy epistle to cheer this heart
Of mine, — to dry the tears which freely flow
For thee, O Rosa, absent from thee so long.
When darkness has set in, I rest alone,
The while I fancy thou art present,
And all my thoughts are fettered by thy love.

A maiden's lament on account of the desertion of her lover.

Retire, O sun! and leave the night to me,
While tears, like water, from these eyes are flowing.
The sound of footsteps is no longer heard,
O Taratu! thou comest not again
By way of Waishipa's headlands; still
The sea-fowl show their breasts at Mitiwai,
But my lover lingers in the north,
Binding thyself to thy own landscapes there.
Ah! shall my days of weeping never cease?

C. F. HOLDER.

Pasadena, Los Angeles county, Cal.,
March 21.

Names of the Canadian Rocky Mountain peaks.

As to the naming of the Canadian Rocky Mountain peaks, Mr. Ingersoll may withdraw his correction made upon the authority of Dr. George M. Dawson. Here is an extract from Douglas's journal, under date of May 1, 1827, printed in companion to *Botanical magazine*, ii. 136, in 1836.

"This peak, the highest yet known in the northern continent of America, I felt a sincere pleasure in naming 'Mount Brown' in honor of Robert Brown, Esq., the illustrious botanist, a man no less distinguished by the amiable qualities of his mind than by his scientific attainments. A little to the southward is one of nearly the same height, rising to a sharper point: this I named 'Mount Hooker' in honor of my early patron the professor of botany in the University of Glasgow."

Dr. Hector, "who in 1857–59 was attached to Captain Palliser's expedition," may indeed have named 'Mount Balfour,' curiously sandwiched between the names of Hooker and Brown. Douglas could not well do that, the worthy Edinburgh professor so honored being at that time a lad of nineteen.

A. G.